Scoping Review: The Impact of Prenatal Yoga on Back Pain and Sleep Quality in Pregnant Women

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ABSTRACT

Introduction: Throughout pregnancy, the expectant mother experiences physiological and psychological alterations. These modifications can significantly affect the mother's many pregnancy complications, including respiratory difficulties, lumbar discomfort, hemorrhoids, and sleep disruptions. Lower back pain (LBP) is a musculoskeletal ailment that can negatively impact the overall well-being of pregnant women. Failure to promptly address the complaint might have detrimental effects on both the mother and the fetus. **Objective:** This scoping review seeks to examine the effects of prenatal yoga on the occurrence of back pain and the quality of sleep in pregnant women. **Methods:** This article conducted a scoping review using the PRISMA approach. Articles published in the last five years (2019-2023) were identified through various sources, including Google Scholar, PubMed, Journal SAGE, Scopus, Science Direct, and EBSCO. This search yielded ten relevant journals. **Findings:** Our examination revealed that engaging in prenatal yoga during pregnancy can help pregnant women reduce back pain and improve the quality of their sleep. **Conclusion:** prenatal yoga is a non-pharmacological therapeutic option for pregnant women to alleviate back discomfort and enhance sleep quality.

INTRODUCTION

The mother and fetus are affected by significant physiological, hormonal, and psychological changes throughout pregnancy, impacting their health and well-being (Kesikburun et al., 2018). The physiological changes observed in pregnant women result from the progressive increase in gestational age. These changes include the growth of the uterus, alterations in bodily structure, and modifications in the hormone system (Fatimah, 2017). Pregnant women experience physiological changes that can affect the discomforts they experience throughout pregnancy. Pregnancy-related complaints encompass symptoms such as dyspnea, lumbar pain, haemorrhoids, and sleep disturbances. This frequently happens, particularly during the third trimester of pregnancy (Azward et al., 2021).

Pregnancy-related low back pain (LBP) is a prevalent symptom experienced by pregnant women. LBP is a musculoskeletal issue that significantly impacts the quality of life of expectant mothers (Manyozo et al., 2019). Low back pain in pregnant women is characterised as pain in the lumbar region, precisely above the sacrum. It can occur on one or both sides and radiate down both legs. The incidence of back discomfort remains significantly elevated in East Asia and Australia, with rates ranging from 75% to 96% (Chang et al., 2014). The unresolved back pain in pregnant women can lead to discomfort and subsequently cause sleep difficulties. Approximately 78% of pregnant women experience sleep difficulties, with some of them occurring during the third trimester. Pregnant women may experience disrupted sleep if they suffer from sleep problems (Aflahiyah, S., Tamtono, D. G., & Prasetya, 2020).

Thus, the mother's well-being is crucial for achieving the best possible outcomes during pregnancy and childbirth. Pregnant women should be offered assistance, resources, and suitable forms and quantities of physical activity during pregnancy to mitigate the likelihood of problems and enhance their well-being throughout this period (Jiang et al., 2015). Pregnant women can engage in exercises such as yoga. Prenatal yoga is a physical activity that promotes equilibrium in the body, mind, and spirit through proper body alignment and the cultivation of supple and robust muscles (Aflahiyah, S., Tamtono, D. G., & Prasetya, 2020). Prenatal yoga offers several advantages, including alleviating muscle tension, enhancing blood circulation, promoting relaxation, reducing cortisol levels (a stress hormone), decreasing anxiety through norepinephrine release, and relieving back and leg pain by increasing serotonin levels. Consequently, it can enhance the quality of sleep for pregnant women (Resmaniasih Ketut, 2021). This scoping review seeks to examine the effects of prenatal yoga on the occurrence of back pain and the quality of sleep in pregnant women.

METHODS

This paper was written based on a systematic review using the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis procedure) approach. The review explicitly examines prenatal yoga's impact on back pain and sleep quality in pregnant women. The search procedure involved using specific criteria for inclusion, which were yoga/prenatal yoga, back discomfort, and sleep quality. A targeted search was conducted using a systematic review approach, gathering significant material from electronic sources. The electronic databases used in this study are Google Scholar, PubMed, SAGE Journals, Scopus, Science Direct, and EBSCO. The data collected is up to November 2023. The search technique employs the keywords "Yoga" OR "Prenatal Yoga" AND "Pregnancy" OR "Back Pain" OR "Low Back Pain" OR "Sleep Quality" OR "Sleep Quality".

The analysis encompasses recently published original and review articles, specifically those published between 2019 and 2023, written in English and Indonesian. The web search yielded 588 articles by retrieving electronic data. The retrieved publications were thoroughly analysed, and 10 of them were selected as the foundation for the analysis in this paper. The method of selecting articles is outlined in Figure 1, a PRISMA chart.
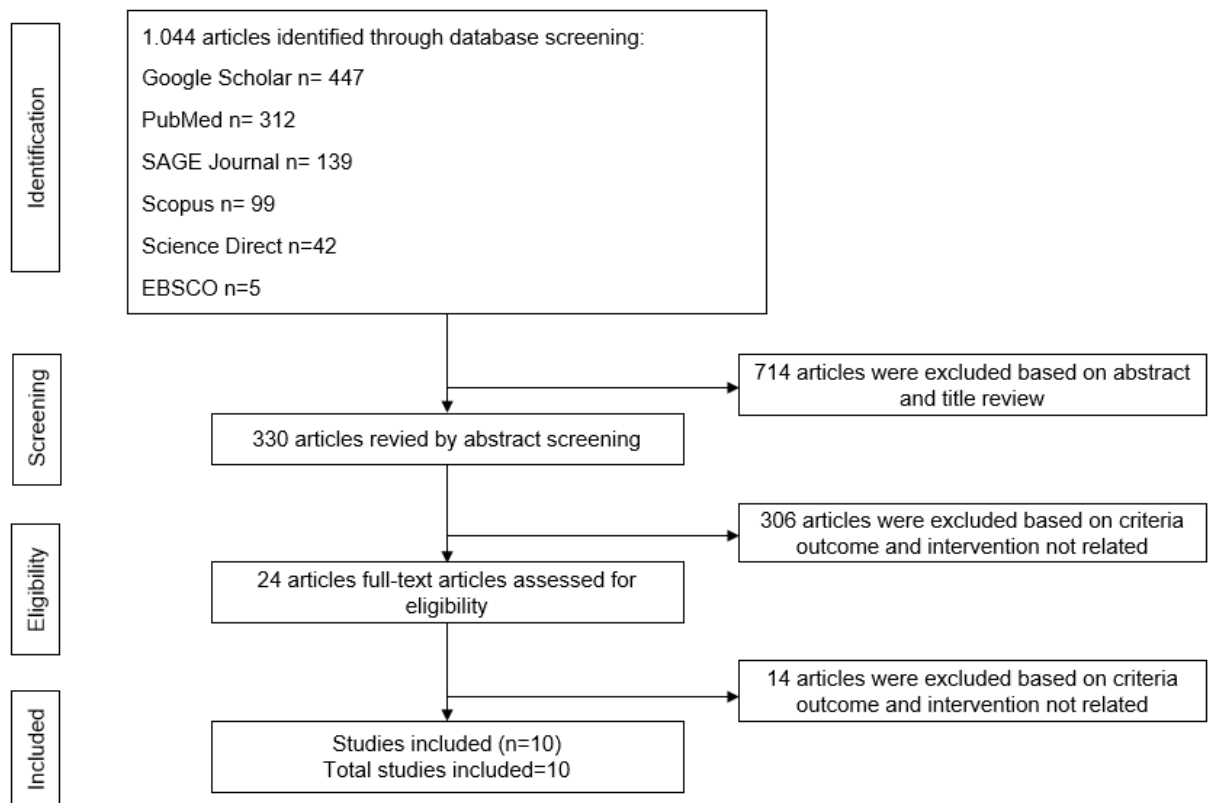
Figure 1. PRISMA Diagram

RESULT

Upon conducting a search using the given keywords, 1,044 articles were chosen. Subsequently, additional identification was performed to narrow the selection to only ten publications for analysis and inclusion in this literature review. The ten articles examined were publications from 2019 to 2023 sourced from reputable online databases such as Google Scholar, PubMed, SAGE Journal, Scopus, Science Direct, and EBSCO. In 2021, six articles were published. In 2023, two pieces were published. In 2019 and 2020, one article was published. The publications evaluated employ several study designs, including Quasi-Experimental, Pre-Experimental, Experimental, Randomized Controlled Trial (RCT), and Systematic Review. The articles included in this analysis encompass two publications from 2021 that employ a Quasi-Experimental design, one publication from 2021 that utilises an Experimental design, three publications from 2021 and 2023 that employ Pre-experimental methods, two publications from 2019 and 2021 that utilise an RCT (Randomized Controlled Trial) design, and one publication from 2020 that engages a Systematic Review design.

Table 1 provides an overview of the attributes of the articles that were considered in the final analysis. The table provides a comprehensive overview of the research, including details about the design, aims, sample, variables, and instruments used. Additionally, it presents the results and conclusions derived from the study. This article examines prenatal yoga's impact on alleviating back pain and enhancing sleep quality in pregnant women. The analysis conducted on the papers in Table 1 revealed a substantial effect of yoga on pregnant women in alleviating back pain and enhancing sleep quality. Prenatal yoga is a physical activity involving modified yoga techniques specifically designed to accommodate pregnant women's physical circumstances and requirements. Yoga is a non-pharmacological therapeutic practice integrating

controlled breathing, physical movement, and focused mental activity to achieve meditation and relaxation (Wagiyo, 2016). Prenatal yoga encompasses five instruction modalities: physical asanas, pranayama techniques for controlled breathing, mudra postures, relaxation exercises, and meditation practices. These methods offer advantages throughout pregnancy, labour, and postpartum (Sindhu Puji Astuti, 2014).

Table 1. Description of the Characteristics of the Analyzed Articles

No	References And Origin Journal	Design Study	Objective Study	Sample	Variables and Instruments	Results	Conclusion
1.	(Geawanty RA. et al, 2021) Journal of Maternal and Child Health Sciences (JAKIA)/ Volume 1, Edition 1/ June 2021	Experimental method	To assess the efficacy of prenatal yoga in alleviating back pain among pregnant women in their third trimester	A group of 32 pregnant women reported experiencing back pain.	Dependent Variable: The variable being studied is the impact of prenatal yoga. The dependent variable of this study is the level of back pain experienced by third-trimester pregnant women. The intervention group comprises pregnant women who engaged in prenatal yoga exercises for 14 days. A single pretest and posttest were conducted.	The findings revealed variations in the severity of back pain among pregnant women in their third trimester before receiving Prenatal Yoga. Most participants, 31 (96.9%), reported experiencing moderate pain, while one (3.1%) reported experiencing light discomfort. The implementation of Prenatal Yoga resulted in a reduction in pain. Specifically, out of the respondents, 29 individuals (90.6%) reported experiencing light pain, two individuals (6.3%) reported moderate pain, and one individual (3.1%) reported no pain. The statistical	A notable disparity exists in the occurrence of back pain in third-trimester pregnant women, both before and after engaging in prenatal yoga.

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						testing using the Wilcoxon test yielded a p-value of 0.000, less than the significance level of 0.05.	
2.	(Leandra, M. N. A. ., Tajmiati, A., & Nurvita, 2021) Journal of Midwifery Information (JoMI)/ Volume 1, No 2/February 2021	Pre-Experimental	This study aims to assess the impact of prenatal gentle yoga on alleviating back pain in pregnant women during the third trimester.	A group of 25 pregnant women who reported experiencing back pain	Dependent Variable: The factor being studied and measured is the impact of engaging in prenatal yoga. The dependent variable of this study is the level of back pain experienced by women in their third trimester of pregnancy. The Numerical Rating Scale (NRS) pain measurement tool was utilised to gather data. The implements utilised are mats and blocks.	The bivariate analysis yielded a ρ value of 0.000 (α = <0.05), indicating a significant difference in the level of lower back pain in third-trimester pregnant women before and after engaging in prenatal yoga. The likelihood value of ρ value <0.05 further supports this conclusion.	Prenatal yoga has a positive impact on alleviating back pain in pregnant women throughout the third trimester.
3.	(MIFTAHUL MUALIMAH, 2021) Jurnal Kebidanan/ Volume 10, No 1/ April 2021	Pre-Experimental	To assess the impact of prenatal yoga on back pain in pregnant women in their third trimester	16 pregnant women were experiencing back pain.	Dependent Variable: The factor being studied is the impact of prenatal yoga. The dependent variable of this study is the level of back discomfort experienced by pregnant	The results revealed that before receiving pregnancy exercise, the average back pain scale value (mean) was 4.69, with a median value of 5.00. The most frequently occurring back pain scale	There is a notable disparity in the impact of pregnant yoga movements on the severity of back discomfort.

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				women in their third trimester.		value (mode) was 5. The standard deviation (std) was calculated to be 1.138. The minimum and maximum values on the pain scale were 3 and 7, respectively. Following the administration of prenatal yoga exercises, the average back pain score (mean) is 2.50, the middle value (median) is 3.00, the most frequently occurring back pain score (mode) is 3, and the measure of variation (standard deviation) is 1.155. The lowest pain score is one, and the highest is 4. The outcome is a p-value of 0.000, which is less than the significance level α of 0.05.	
4.	(Holden et al., 2019) Global Advances in Health and Medicine/Volume 8 page 1–11/March 2019	RCT	The objective was to evaluate the feasibility of conducting a randomised controlled trial (RCT) to investigate the effects of prenatal yoga on gestational	Women between 18 and 39 who were in the second trimester of their pregnancy (12-26 weeks) and had uncomplicated	The independent variable in this study is prenatal yoga. The dependent variables in this study are gestational low back pain (LBP),	From April 2015 to December 2015, 168 women were contacted, and out of these, 115 women (68%) were determined to meet the eligibility criteria.	Considering the observed recruitment, compliance, and acceptance, it seems that implementing a prenatal yoga intervention to enhance

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			low back pain (LBP), mobility, and maternal well-being.	pregnancies were divided into two groups based on whether they had lower back pain (LBP). One group attended weekly yoga classes, while the other attended timed educational support groups. This lasted for 12 weeks.	mobility, and mother well-being. Exclusion criteria: individuals with notable spinal conditions (such as spinal stenosis, previous fractures, or severe pain requiring treatment), those who had participated in over ten yoga classes within the last three months, and individuals with pregnancy complications (including uncontrolled hypertension, uncontrolled diabetes, placenta previa, multiple pregnancies, and advanced maternal age).	Twenty women were included in the study, with eleven assigned to the yoga group and nine to the control group. The average gestational age of the participants was 20.2 weeks. The retention rate at the 12-week mark was 81% for the yoga group and 77% for the control group. Yoga does not have any associated adverse effects. Initial research revealed no discernible disparity in back pain impairment across the groups. Statistically significant group differences were observed in biomechanical tests, such as the % change in gait speed (F = 4.4, P = .04), double support time (F = 23.6, P < .01), timed-up and-go instrument (F = 8.6, P < .01), and turn time (F = 5.7, P = .02). These findings	gestational low back pain (LBP) and maternal well-being is both achievable and secure. No changes in back pain were detected. However, biomechanical measures proved a sensitive evaluation for evaluating mobility impairment related to gestational LBP and revealed variations between the groups. There was a notable disparity in symptom burden as indicated by the PSI over 12 weeks, suggesting that practising yoga could enhance the general state of well-being among pregnant women.

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						indicate that yoga led to clinically meaningful improvements in these measures. The Pregnancy Symptom Inventory (PSI) ratings showed improvement at 12 weeks in the yoga group compared to the control group, with a difference of 13.1 points (95% confidence interval, 5.1–21.1). This improvement was adjusted for early gestational age.	
5.	(Saputri Ika Nur, Nurianti Irma, 2023) Jurnal Pengmas Kestra (JPK)/ Volume 3 No 1/ Juni 2023	Presentations and demonstrations	To alleviate back pain, individuals engaged in community service can utilise prenatal yoga.	Ten pregnant women experiencing lumbar discomfort	The independent variable in this study is prenatal yoga. Dependent variable: occurrence of back discomfort	A study revealed that 90% of pregnant moms reported feeling content after participating in prenatal yoga sessions, while 80% experienced reduced back discomfort.	Prenatal yoga activities alleviate lumbar discomfort in expectant mothers.
6.	(Azward et al., 2021) Gaceta Sanitaria/ Volume 35(S2), Pages S258 - S262/ July 2021	Quasi experiment	This study aims to assess the impact of engaging in prenatal yoga during the third trimester of pregnancy on the quality of sleep experienced	There were 60 pregnant women in their third trimester. There were a total of 30 intervention groups. • There were 30 individuals	Dependent Variable: The variable being studied is the impact of prenatal yoga. Dependent variable: The sleep quality experienced by pregnant women in	Univariate analysis reveals that both dominant groups fall within the age range of 20 to 35. Additionally, both groups tend to have lower levels of education.	The sleep quality of pregnant women in the third trimester improves significantly after engaging in yoga exercises.

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			by pregnant women.	in the control group. Inclusion criteria: • Only individuals with a single pregnancy will be considered. • The gestational age must be equal to or greater than 28 weeks. • Participants must be willing to practice yoga four times during two weeks. • The fetal growth and development must align with the corresponding gestational age.	their third trimester. Control group: Pregnant women who had standard antenatal check-ups as part of their regular care. Intervention group: Pregnant women who were given prenatal yoga exercises four times within two weeks. A single pretest and posttest were conducted. This study employs a questionnaire tool that examines the attributes of participants and assesses the quality of their sleep using the PSQI (Pittsburgh Sleep Quality Index).	• The control group is primarily composed of women who have given birth multiple times, while the intervention group is composed mainly of women who have given birth for the first time. • Both groups exhibit a high rate of unemployment (IRT). Neither group had previously been provided with information regarding prenatal yoga. • Bivariate analysis revealed no significant difference in the sleep quality of pregnant women in the third trimester before and after the test in the control group (p > 0.05). However, in the intervention group, there was a significant difference in the sleep quality of	

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						pregnant women in the third trimester before and after the test (p < 0.05) after they participated in yoga practice four times over two weeks, with each practice session lasting 60-90 minutes.	
7.	(Susanti Neny Yuli, 2023) Profesional Health Journal/ Volume 5 No 1sp PDP/ page 8-16/ Oktober 2023	Pre experimental	To assess the impact of prenatal yoga on the sleep quality of pregnant women in the third trimester	A group of 35 women are now pregnant. Inclusion criteria: Pregnant women who have undergone homogenisation in their 28th to 36th week of gestation.	Other variables do not influence factors manipulated or controlled in an experiment. prenatal yoga Dependent variable: The measure of the quality of sleep experienced by pregnant women in their third trimester of pregnancy. The investigation was conducted thrice over 12 days. The instruments employed include Standard Operating Procedures (SOP) and questionnaire	Before engaging in yoga exercises, all 35 pregnant women (100%) reported poor sleep quality. However, after participating in yoga exercises, nearly all of the respondents, 29 pregnant women (82.8%), saw an improvement in sleep quality. This improvement was statistically significant, with a p-value of 0.000.	The sleep quality improved after performing yoga movements.

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8.	(Resmaniasih Ketut, 2021) Jurnal Kesehatan Madani Medika/ Volume 12 No 02/ page 252-258/ Desember 2021	Quasi experiment	The objective is to assess the impact of prenatal yoga on the sleep quality of pregnant women in the third trimester.	A group of 30 women who are now expecting a baby There are 15 groups receiving intervention and 15 groups in the control group. Inclusion criteria: Pregnant women in their third trimester who do not have any medical conditions that would prevent them from participating in prenatal yoga, such as incorrect positioning of the fetus, preeclampsia, or placenta previa.	Independent variable: Prenatal yoga Dependent variable: The measure of the quality of sleep experienced by pregnant women. Trademark III Control group: provided with conventional maternity care services The intervention group received biweekly yoga sessions lasting 60 minutes each for four weeks. Assessing sleep quality using the Pittsburgh Sleep Quality Index (PSQI).	The findings indicated a notable disparity in the average variation in sleep quality among pregnant women in the third trimester who received yoga (mean difference = 1.13) compared to those who did not receive yoga (mean difference = 0.76), with a statistically significant p-value of 0.021 (p<0.05).	The sleep quality of pregnant women in the third trimester is affected by prenatal yoga.
9.	(Aflahiyah, S., Tamtono, D. G., & Prasetya, 2020) Jurnal Kesehatan Ibu dan Anak (JMOH)/ Volume 05 No 06/ page 629-640	Systematic review and meta-analysis	To assess the mean efficacy of prenatal yoga in improving sleep quality and reducing anxiety levels during pregnancy	The research data was acquired by searching systematic and extensive databases such as PubMed, Google Scholar, Science Direct, Cochrane Library, and Springer	The independent variable in this study is prenatal yoga. Dependent variables: The quality of sleep and anxiety levels experienced during pregnancy. Searching for articles using the PICO model	The forest plot analysis demonstrates that prenatal Yoga helps reduce anxiety in pregnant women. The practice of prenatal Yoga resulted in a 0.84-fold decrease in anxiety compared to not practising prenatal Yoga, and this	The forest plot results indicate that engaging in prenatal yoga practice can decrease anxiety by a factor of 0.84 compared to not practising prenatal yoga (standardised mean difference = -0.84; 95% confidence interval -1.53 to -0.16; p-value

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				Link. By utilising the search terms "Prenatal Yoga" OR "Anxiety" OR "Quality Sleep" OR "Sleep" OR "Pregnant Women" OR "During Pregnancy" AND "Randomized Controlled Trials". Criteria for inclusion: Articles written in English and available in their entirety. Exclusion criteria: papers without randomised controlled trial (RCT) study designs were published before 2005.	The Review Manager (RevMan 5.3) was used to handle the data. This involved computing the standardised mean difference to establish the combined research model and generate the final results of the meta-analysis.	reduction is statistically significant (p= 0.020). The forest plot results indicate that the practice of prenatal Yoga enhances the sleep quality of pregnant women by 1.13 times when compared to those who do not engage in prenatal Yoga. The observed result has a high level of statistical significance, with a p-value of 0.020. The heterogeneity in the study data is shown by an I2 value of 90%, confirming a heterogeneous data distribution and necessitating a random effect model.	= 0.020). The forest plot results indicate that prenatal yoga can enhance sleep quality (SMD= -1.13; 90% CI -2.06 to -0.21 p=0.020). Negative findings on the Subjective Sleep Quality Scale suggest an improvement in the overall quality of sleep. The Pitsburg Sleep Quality Instrument and the Self-Rated Sleep Scale were utilised as the assessment tools.
10.	(Namdar et al., 2020). EBSO/ Volume 24 Issue 7/ page 24-30/ August 2020	RCT	To assess the impact of hatha yoga on the occurrence of low back pain and the quality of sleep in pregnant women who have not given birth before.	A total of 60 pregnant women who had never given birth before There are a total of 30 intervention groups and 30 control groups.	independent variable: Hatha yoga Dependent variables: The variables being measured are back pain and sleep quality. The intervention group participated in yoga lessons twice	The results of this study, which utilised the Wilcoxon test to compare low back pain, indicate that there was no statistically significant change in pain scores between the intervention group before (p = 0.057)	The study found that Hatha yoga did not substantially impact the scores of low back pain in the intervention group. However, it did have a notable effect on improving sleep quality.

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					weekly throughout the 26th to 37th week of pregnancy. This study employed a demographic information questionnaire, a visual pain scale, and the PSQI (Pittsburgh Sleep Quality Index) questionnaire. The software being referred to is SPSS, specifically version 24. and statistical measures of central tendency and variability	and after (p = 0.172) the intervention. Furthermore, employing the Sign test (p= 0.007) and the Wilcoxon Signed-Rank test (p= 0.001), the sleep quality scores in the intervention group exhibited a notable disparity before and after the study, indicating a meaningful distinction.	

DISCUSSION

A published study analysis can serve as a reliable source for evaluating the efficacy of prenatal yoga for expectant mothers. The advantages of practising yoga encompass the following:

1. Alleviates lumbar discomfort

The prevalence of back discomfort during pregnancy is high among pregnant women worldwide (Gutke et al., 2018). Low back pain (LBP) during pregnancy is mainly attributed to physiological alterations, such as increased maternal weight, spinal lordosis, reduced abdominal muscular strength, shifts in the centre of mass, and weakened joints owing to relaxation (Cakmak et al., 2014). Hence, it is imperative to offer pregnant women suitable assistance, resources, and guidance and prescribe specific types and quantities of physical exercise to minimise the likelihood of problems and enhance the overall results of pregnancy and childbirth (Jiang et al., 2015). Exercise is a recommended physical activity for pregnant women to alleviate low back pain. Yoga can serve as a viable approach to alleviate back pain in expectant mothers. Yoga is a holistic discipline that integrates physical, mental, and spiritual elements via physical postures, relaxation techniques, and controlled breathing exercises (Curtis et al., 2012). This yoga practice has been modified specifically for the physiological needs of pregnant women. It is a popular type of physical activity among expectant mothers and is highly recommended by

healthcare professionals (Mooventhan, 2019). Research findings indicate that practising yoga during pregnancy is secure, achievable, and well-received by expectant mothers. Furthermore, it may offer more significant advantages than walking and conventional prenatal exercise (Battle et al., 2015). Pregnant women can experience relaxation of their muscles and a sense of calmness in their minds via gentle and soothing yoga practices. Two randomised control trials (RCTs) investigating the effects of pregnant yoga found that it can effectively alleviate pain, stress, anxiety, and sadness (Martins & Pinto e Silva, 2014).

2. Enhance the quality of sleep

The discomfort mothers experience during pregnancy can arise from physiological and psychological changes. These alterations can lead to disruptions in sleep patterns. Pregnant women who suffer from sleep disorders will see a decline in the quality of their sleep. Inadequate sleep quality during pregnancy can lead to insufficient sleep for the expectant mother, resulting in low birth weight (LBW) and early birth, as well as compromised immunity and endurance in the newborn. In addition, insufficient sleep can have adverse effects on pregnant women, including increased stress and sadness, which can potentially affect the developing fetus. Subtle stress can lead to a rise in the fetal heart rate, but intense stress can result in heightened fetal hyperactivity (Okun et al., 2011). Insufficient sleep during pregnancy might result in prolonged labour and potentially necessitate a cesarean delivery (Marwiyah & Sufi, 2018). Prenatal yoga is an exercise that pregnant women can engage in to alleviate anxiety and enhance the quality of their sleep (Field et al., 2013). According to research findings, engaging in prenatal yoga for eight weeks, with each session lasting 90 minutes, has decreased anxiety, elevated cortisol hormone levels, and enhanced sleep quality among pregnant women (Kundarti et al., 2020).

CONCLUSION AND SUGGESTION

After analysing ten publications obtained from reliable databases and journals, it was discovered that prenatal yoga has a beneficial effect on reducing pregnancy discomfort and provides many psychological and physical benefits for pregnant women. Prenatal yoga is advantageous for reducing back pain and improving sleep quality in expectant mothers. Prenatal yoga is a safe and non-pharmacological therapy that provides multiple benefits for pregnant women. Prenatal yoga is a highly effective method for reducing back pain and improving the quality of sleep in pregnant women. The midwife or another healthcare professional should provide prenatal yoga lessons, allowing pregnant women to engage in regular prenatal yoga sessions to relieve back discomfort and improve the quality of their sleep.

ACKNOWLEDGEMENT

offered to facilitate this research. We anticipate that this review will yield several advantages and a deeper comprehension of the impact of prenatal yoga on back pain and sleep quality in pregnant women.

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